

PAGE: 1

RAW SEQUENCE LISTING  
PATENT APPLICATION US/09/327,230DATE: 11/17/1999  
TIME: 16:21:53

Input Set: I327230.RAW

This Raw Listing contains the General Information  
Section and up to first 5 pages.

ENTERED

1 <110> APPLICANT: Johal, Gurmukh S  
2 Gray, John  
3 <120> TITLE OF INVENTION: METHODS AND COMPOSITIONS FOR CONTROLLING CELL DEATH AND  
4 DISEASE RESISTANCE IN PLANTS  
5 <130> FILE REFERENCE: 035718/174733  
6 <140> CURRENT APPLICATION NUMBER: US/09/327,230  
7 <141> CURRENT FILING DATE: 1999-06-07  
8 <150> EARLIER APPLICATION NUMBER: 08/810,009  
9 <151> EARLIER FILING DATE: 1997-03-04  
10 <160> NUMBER OF SEQ ID NOS: 8  
11 <170> SOFTWARE: PatentIn Ver. 2.0  
12 <210> SEQ ID NO 1  
13 <211> LENGTH: 2822  
14 <212> TYPE: DNA  
15 <213> ORGANISM: Zea mays  
16 <400> SEQUENCE: 1  
17 gcaacgcaca cagacaggca gcgatgtctt tcgcgggtca gtaaaccctca ctcacacagg 60  
18 ctattcgtct taagtttttt tgttcaacat cacatacttg tgttgctaata gtaacaaaaa 120  
19 aaattcacac gcttcacaaa cattacaata tgattcaaaa tagacactaa ccaaacccttg 180  
20 gaggactttg tactggctag agaacaccta ctctactgct atgctgctta cccgagacag 240  
21 aggaaataca cagcagcaac tgttggtggac ttgttgcaaa atagcaagga aaggtattag 300  
22 taatagcaag cataattgta ggagctgcaa gtataacaat gatagtctgc tcttttagtac 360  
23 cttacatgta tgaaataaaa aactatatag gtaaagttaa caacatgcgt tatgtaaatc 420  
24 tagcagacta ttggattgaa aagaattcaa ttacaaggac aaagaatgac tgacgagggc 480  
25 agcaacacaa taactaaatg ttccaaaatg gtcagatatg aagggctcga acgcatgcac 540  
26 ggcattgatat gctagttggg gccgtttccg tcgggcttta aagataagga aatctggata 600  
27 tggactaatg atgtctaatt tttgttagag cctagcgccc tagcatgcta actagaagg 660  
28 taattttgtt tctatttttt gttgcaccga ctgagccaac attcttttgt ctagtatttt 720  
29 acattttagt tactactctc ttcgtctaaa aagtactata tctccatttt ttaaaatgtc 780  
30 ttgctttttg aagagcacta tcttttaaaa tcttgaccaa ctatataaaa gtacttctga 840  
31 tacatgatag gtttaataaaa atatataaaa tcttatattt ttagtaagtc tagtcaaact 900  
32 taagagcttt tgatgtcgca catagtgtgt ttaaacaagg tgtttgttca tgttcgttct 960  
33 aatatgtgga tagtattccg attcatttcg ccagaggtgt ggctgtggat atttggttag 1020  
34 agcatcttca agaaaaccg taaatcaact ccaaaaacgt tttgagcctc ccaacagtcc 1080  
35 ccttccctcc ccccatatta cgcgtcaagc attgttccca atcgtcctct gcgcatgctg 1140  
36 gttccacagt gtattttcct cgcgcgcagt tctgttgagg gaggaaggcg ggacgttggc 1200  
37 actagcgtg gctggagatt atggccatcg caatcagttt gtggcagtc aatgctttgt 1260  
38 ttttttggcc gctcatgtga gtatcatttc tgtgaaaact atctaaatca atatgaatgt 1320  
39 atatttcttt aagtcgtcac gataggaaga ctccatcggt ctaaaacct aacctgcac 1380  
40 acatattcat ctttctccaa acgcaagtct cgtgatattt atattctcgt gccagctaga 1440  
41 ttatctagaa atttagattc ttaaaaaaat tcttttagaaa aaaaattata ccaaacagga 1500  
42 ccatggttta aactattacg gataaatagc atgactacct tagtatttaa atgatatcag 1560  
43 ttgaaatatg tcgacttatt ttatagttag tattattaga acatgtttta ataattatca 1620  
44 catttaaacc agatctacat ataaactatt ttgcttgcac actgcacgc aaactcactt 1680

PAGE: 2

RAW SEQUENCE LISTING  
PATENT APPLICATION US/09/327,230

DATE: 11/17/1999  
TIME: 16:21:53

Input Set: I327230.RAW

```

45      gcctaccatc gggatcgcg cgtatatacaa gtgacacact ttaaagtatt taagccgcga 1740
46      aaattataaa tgtaccatcc tcatttggca agtctaaaga tagctttacc atacaaatga 1800
47      aactaaattht aaaattccaa gtaataatta gaaaaactga tttgacagtt ttttcagtat 1860
48      atatttagca gctcgctaaa tctgaattta gaaagtthtt ttgaaatgag ttgagatgct 1920
49      cttataatgg ttactatagg ttgaggagcg gaagtagtag tagaactggg aaacaaattc 1980
50      gaatttgatc tattcaactt tgtagctact cagcaagatg cgaattgcaa acatccggcg 2040
51      ggggtggattc cgccacggcc cacgggtggg ttcgtgtcgt tctcaccgcc ggtcaatctc 2100
52      ccctccgcgc ggcgcaattc gtcccggtgg ggacggctag ctggcccaat gccaaagctc 2160
53      caccgacaaa tgccgcaaag cgccatgcgt ggtcgcgtac aattgcctcc tcccccgccc 2220
54      ttctccctt ccctgccgtg acgcaaccac actgcgtca ccactgtgta caatgtattc 2280
55      tccttagccg aaccgtatca gtatgtctta ggggtggcg ttccgggttac ccgaaattht 2340
56      cgggttgggt aattcaagtt thttaaatth cgggtthtga gaatcaatac ccgaaattac 2400
57      aacggattht tcaatacccg gaatttcggg taccgggaat ttccgggttcg ggttcgggta 2460
58      tthccaaact accgaaacta ttgtgttggc thcataaaaa cacatacacc ctattaaatt 2520
59      agtataaaaa tatagthtga ataagtatat acatggacat ataaaaacaca aacaatctac 2580
60      aatcccaagt tatgcacact tacacataat tatagatgta caaactthaa thattaaagc 2640
61      atgacatgag tacatgacac atgaaagccg ggtaattcgg gtatttcggg taccggattg 2700
62      tgatacccgga attaccgaa ataatttcgg gthttgcaag ttgctaccgc aaattcccaa 2760
63      acaaaattcg ggtthtcgggt atttcgggtt cgggttcggg tattccaggt ttgggtthtcg 2820
64      gg
65      <210> SEQ ID NO 2
66      <211> LENGTH: 4015
67      <212> TYPE: DNA
68      <213> ORGANISM: Zea mays
69      <400> SEQUENCE: 2
70      ttacgggttht tttgcccagc cctactagtt ctthccctcgc gttcactccc cagcgtggga 60
71      aaatcccgga atthttctgt ttgtccactg gthttcttgc gccaaaacca ggtthtctcc 120
72      cgttgccgtg gcagaactct gttcttgccc agtctagaag atctgcaccg thccaaccac 180
73      cgactccggc cgccaagcat atagccagcg cggcgagaa thcccaacgc gaaagccaaa 240
74      acctcttcac ttacttcac gtcgacacgt gcggggagaa tatgcgcgcg acaatccag 300
75      ccctgtcgt cctggtgacg ccgcggctcc cctcgtcgc cgtgcgcgtg gctggaggcc 360
76      gcctccgcga ggcgggtcgt tctcggaccc gcctccgcgt ggcggcgccg acgtccgtac 420
77      caggggaagc ggcggagcag gcggagccga gcacgtcggc gcccgagtcc ggcgagaagt 480
78      tctcgtggag ggatcactgg taccgggtct cctcgtcga ggacctcgac ccagccgcc 540
79      ccacccgtht ccagctcctc aaccgcgacc tgcgtcatct gaaggaaccc aagtccggcg 600
80      agtgggtcgc gtcgacgac cgctgcccc accgccttgc cccgctctcg gtacggcgac 660
81      ccgcatccct tctcgcctc atccgtgtcc taccggatct ctthctcgtt tcggctaatt 720
82      ttggtctggg catgtgcagg agggcaggat cgatgagacg ggtgtcttgc agtgctcgt 780
83      tcacggatgg tcattcgatg gctccggcgc ctgcaccaag atccccagg ccattgcccga 840
84      gggctctgag gcccgwgcgg tgcggtcacc gaaggcgtgc gcgatcaagt tccccaccct 900
85      cgtctcccag ggcgtgctct tctgtgtggc cgatgagaat ggtggggaga aagcggccgc 960
86      caccaagcct ccaatgtgcg tagagtcaga cthtggactg cggctaattg gttggattca 1020
87      gthttgcatt tcgggtgtctg aattcgatct tathtggtht caggttgccg aaagaattht 1080
88      aggaccgcgc ctthctccag gtgacaatcc agagggactt gthctatggg tatgatacgt 1140
89      tgatggagaa cgtctctgat ccgtcccata tagaatttgc tcaccacaag gtacttggt 1200
90      cagtgagaaa gcttagttgc ttgccacact taagcaccat gatagtattht thcagttgaa 1260
91      agttgggtgat tcgaggaaag atgtthttht gcaaccaatt tgtgtagtht gctaaaaaat 1320
92      cacctcctca atactgttht attgtgtagg cthcttatcg thtctgattg ccagtgtgca 1380
93      agthtaacta actgttagat cttaactgtg gatgtacca tataththt thgcatcata 1440
94      gthttattct thtttactta tgctgcattg aaattcctca gaaatgactt ataatgggca 1500

```

PAGE: 3

RAW SEQUENCE LISTING  
PATENT APPLICATION US/09/327,230

DATE: 11/17/1999  
TIME: 16:21:53

Input Set: I327230.RAW

```

95      aaagggctga atggctgagt ctggcctctt atcgtttcta gattgccagc gtgcaagttt 1560
96      aactaaggtc ccgttttggtt tgagggatta aatatcagtg cctccatttt agtcccattt 1620
97      agtccataaa ttgacaaacg gtgggactaa aacaaggact aaactgttct agtctctagt 1680
98      ccctcaaggg atgactctaa ggggctaaac cataaaaatc cacttttttg ccctccttca 1740
99      tttcagttgc actaatggcg ggaggatgtt aaggagtatt ttggtcttct tatgattcat 1800
100     ttaatgtgtt ttgaatactt atagttttta gaaccaaaca gggagggact aaattttagt 1860
101     cttctaacta aactttcgtc cctggactaa aggaaccaa ccctaactgt tagatcttaa 1920
102     ctgtggatgc acccatatat atttttgcat catagtttta gttctttttt acttacgcta 1980
103     cttgcttagt ctgaacaggc attaataggg tgtttggtt gagggattag ttagttcacc 2040
104     cactcattcc tcttttcttt gtttggtttg ttgaatggag taggttggtc agtgcattat 2100
105     cacatcattc ctcagactag tagttagtac tagtatgaag aatgggggtc ttcaaccaa 2160
106     ttttaaggaat tgactcatga tgcatacca catttagaat ggagtggctc ctcaaaccaa 2220
107     accctataaa tgactggctg agttaattgt gctatctgtg tgtcatgaac ttgtgccggc 2280
108     agcatagaca acaaaaatgc tttattttct cgggatacat ggtttcagca aatccactca 2340
109     tgtttcagat ttttaactct cacaggttac tggacgaaga gatagagcca ggcctttgac 2400
110     attcaggatg gaatcaagtg gtgcctgggg ttactcagga gcaaattctg gtaatcctcg 2460
111     cattactgca acttttgagg cccttggtta tgcattaaac aagtaagttt cagaaaagta 2520
112     cctggctatc tttgagtgtg gagtgattct tatttaccac ttaagcaatt cagtcgttat 2580
113     acggttctga acttctgtta actggcttgt acagaataga gatagacaca aagttaccca 2640
114     tttttggcga ccagaaatgg gtcatatgga tttgctcttt caacattcca atggccccag 2700
115     ggaagactcg ttctattgtc tgtagcgctc gaaacttttt ccagttcaca atgccaggaa 2760
116     aagcatgggtg gcaggtacat gtgtgtttag tgtttccttt acttaagctt tgttttccta 2820
117     tttgttttgt caacataatc ttttaactgc taaaacgaac ttgttctcgc gtttttgtgg 2880
118     gaaacaaggc aaaggtccct agtcctact gtaggcata attattggca gaggttatta 2940
119     cttggctatg tttgaattta tatgtgtaca gtcaaatgtt gatagcttct ttctcttggg 3000
120     gtagcttggt cctcgatggt atgaacattg gacttcaa attggtctat atggcgatat 3060
121     gatcgttctt caaggccagg agaagatttt ctagctgca accaaggagt cttctacgga 3120
122     tattaatcag cagtacacaa agatcacatt cacgcccaca caagctgatc gatttgtttt 3180
123     agcatgccgc acgtggctaa ggaaatttgg caatagccag ccggagtggg ttggaaatcc 3240
124     tacacaagaa gcattgcctt ccaccgtcct ttcaaagcgc gaggtaaaag ccatctgggt 3300
125     caccaaaaaa gtttcagtat aatatttgct tcagacataa aatatctgaa tatgacaacc 3360
126     tttttggtgg tcaaagatct gttttgctta cattcttaat actcgatgca ttggtaagtt 3420
127     attacagtta tcctttttac tcgatttttc cttttctgag cagaactatt atcacgtctt 3480
128     cattgtttgt acacttggtt tctatgacac acaaattttt attttacatt atcagttgtc 3540
129     atatgaacta atgtatttac agcaacctgc ttaagtgtt agtatcaca agggacaaat 3600
130     tcaatgaaat atttggaag atagtgcgt cgaaccactc tcacagctag gcatttgaga 3660
131     atagttactt aactgacagc gaagttcacc ttctaccgac tggatctgga aacagtatct 3720
132     tgaagtagtt cacacgtaaa cttcatcag ctgtgtttct ggcttcagt aactcatgta 3780
133     ttcttatgat tgactttgtg ttatgcagat gtagacaga tacgagcagc tctcgttgaa 3840
134     atgctcgtct tgcaaaggag catataatgc tttccagaat ctgcagaagg tattcatggg 3900
135     agcgacagta gtttgctgtg ctgccgctgg tattcctcca gatgttcagc tcaggctatt 3960
136     gatcggtgcg gctgctttgg tcagtgccgc tatagcatac gcattccatg agctc 4015
137     <210> SEQ ID NO 3
138     <211> LENGTH: 28
139     <212> TYPE: DNA
140     <213> ORGANISM: Artificial Sequence
141     <220> FEATURE:
142     <223> OTHER INFORMATION: Description of Artificial Sequence: PRIMER
143     <400> SEQUENCE: 3
144     tggggaactt gatcgcgcac gccttcgg

```

PAGE: 4

RAW SEQUENCE LISTING  
PATENT APPLICATION US/09/327,230DATE: 11/17/1999  
TIME: 16:21:53

Input Set: I327230.RAW

145 <210> SEQ ID NO 4  
146 <211> LENGTH: 25  
147 <212> TYPE: DNA  
148 <213> ORGANISM: Artificial Sequence  
149 <220> FEATURE:  
150 <223> OTHER INFORMATION: Description of Artificial Sequence: PRIMER  
151 <400> SEQUENCE: 4  
152 tcgggcatgg cctgggggat cttgg 25  
153 <210> SEQ ID NO 5  
154 <211> LENGTH: 20  
155 <212> TYPE: DNA  
156 <213> ORGANISM: Artificial Sequence  
157 <220> FEATURE:  
158 <223> OTHER INFORMATION: Description of Artificial Sequence: PRIMER  
159 <400> SEQUENCE: 5  
160 ggccacgcgt cgactagtag 20  
161 <210> SEQ ID NO 6  
162 <211> LENGTH: 35  
163 <212> TYPE: DNA  
164 <213> ORGANISM: Artificial Sequence  
165 <220> FEATURE:  
166 <223> OTHER INFORMATION: Description of Artificial Sequence: PRIMER  
167 <400> SEQUENCE: 6  
168 gtgctcggct ccgctgctc cgccgcttcc cttgg 35  
169 <210> SEQ ID NO 7  
170 <211> LENGTH: 7  
171 <212> TYPE: PRT  
172 <213> ORGANISM: CONSENSUS SEQUENCE  
173 <220> FEATURE:  
174 <223> OTHER INFORMATION: CONSENSUS SEQUENCE FOR THE REISKE-TYPE [2Fe-2S]  
175 CLUSTER  
176 <220> FEATURE:  
177 <223> OTHER INFORMATION: Xaa at positions 2, 4 and 6 can be any amino acid.  
w--> 178 <400> SEQUENCE: 7  
179 Cys Xaa His Xaa Cys Xaa His  
180 1 5  
181 <210> SEQ ID NO 8  
182 <211> LENGTH: 7  
183 <212> TYPE: PRT  
184 <213> ORGANISM: CONSENSUS SEQUENCE  
185 <220> FEATURE:  
186 <223> OTHER INFORMATION: CONSENSUS SEQUENCE FOR MONONUCLEAR NON-HEME  
187 Fe-BINDING SITE  
188 <220> FEATURE:  
189 <223> OTHER INFORMATION: Xaa at positions 2, 4 and 6 can be any amino acid.  
w--> 190 <400> SEQUENCE: 8  
191 Glu Xaa Asp Xaa His Xaa His  
192 1 5

PAGE: 5

VERIFICATION SUMMARY  
PATENT APPLICATION US/09/327,230

DATE: 11/17/1999  
TIME: 16:21:53

Input Set: I327230.RAW

Line ? Error/Warning

Original Text

179 W "N" or "Xaa" used: Feature required

Cys Xaa His Xaa Cys Xaa His

191 W "N" or "Xaa" used: Feature required

Glu Xaa Asp Xaa His Xaa His